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The Gradient in Longitude of Atmospheric constituents above the Mediterranean basin (GLAM) airborne campaign has been set up to investigate the variability of constituents (pollutants and greenhouse gases) and aerosols between the West and the East of the Mediterranean Basin in summer 2014. This campaign occurred in the framework of the Chemistry-Aerosol Mediterranean Experiment (CHARMEX) as part of the Mediterranean Integrated STudies at Regional And Local Scales (MISTRALS) programme. During the campaign, several instruments including the Spectromètre InfraRouge In situ Toute altitude (SPIRIT) instrument onboard the SAFIRE Falcon-20 aircraft measured aerosols, winds, radiation, humidity and chemical compounds such as O_3, CO, CH4, N2O, and CO_2. The campaign took place from 6 to 10 August 2014 from Toulouse (France) to Larnaca (Cyprus) and back, via Menorca (Spain), Lampedusa (Italy) and Heraklion (Crete). The aircraft flew at about 5000 m altitude above sea level to go and at about 9000 m altitude to return. The campaign also provided some vertical profilings from the surface to about 12 km in the vicinity of the landing sites listed above. The present paper shows an overview of the measurements and of the scientific results obtained during GLAM combining space-borne and surface station measurements, modelling (MOCAGE and ALADIN-CLIMAT) and chemical forecasts and analyses from Copernicus Atmospheric Monitoring Service (CAMS) run by the European Centre for Medium range Weather Forecasting (ECMWF). Along an East-West axis or along the vertical, we analyze different processes. Among the different processes that have been studied in detail, we will particularly focus on aerosol results concentrating on the intercontinental transport and comparisons with surface stations. Combining GLAM, back-trajectories, satellite and model data, we demonstrate that the biomass burning from northern America, desert dust from Sahara and O_3-depleted maritime boundary layer air masses from the Arabian Sea impacted the upper tropospheric Mediterranean Basin after 10-15 days of transport. Finally, vertical profiles of aerosols measured by Lidars at different stations of the Mediterranean Basin are compared with in situ GLAM measurements and model outputs.